



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,387	03/12/2004	Yong-Jin Kim	51747/DBP/Y35	8856
23363	7590	02/20/2007	EXAMINER	
CHRISTIE, PARKER & HALE, LLP			TRAN, MY CHAU T	
PO BOX 7068			ART UNIT	PAPER NUMBER
PASADENA, CA 91109-7068			2629	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	02/20/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/800,387	KIM, YONG-JIN	
	Examiner	Art Unit	
	MY-CHAU T. TRAN	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 22 June 2004.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-6 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 12 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>3/12/04</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____.

DETAILED ACTION

Application and Claims Status

1. Claims 1-6 are currently pending and are under consideration in this Office Action.

Priority

2. Receipt is acknowledged of papers, (i.e. Korean Patent Application No(s). 2003-0016544; Filed: March 17, 2003), submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) filed on 03/12/2004 has been reviewed, and the references that have been considered are initialed as recorded in PTO-1449 form.

Drawings

4. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This is an enablement rejection.

There are many factors to consider when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any experimentation is “undue”. These factors include, but are not limited to: 1) The breadth of the claims; 2) The nature of the invention; 3) The state of the prior art; 4) The level of one of ordinary skill; 5) The level of predictability in the art; 6) The amount of direction provided by the inventor; 7) The presence or absence of working examples; and 8) The quantity of experimentation necessary needed to make or use the invention based on the disclosure. See *In re Wands* USPQ 2d 1400 (CAFC 1988).

(1-2) The breadth of the claims and the nature of the invention:

The claims are drawn to a gray-scale representation method for a plasma display panel. The method comprises the steps of a) arranging, in time sequence, a plurality of subfields each having a brightness weight, and achieving gray-scale representation by a combination of the

subfields, each subfield including an address period and a sustain period; and b) determining the number of sustain pulses for each subfield so that a light generated from the difference of the number of sustain pulses between two adjacent gray scales can be greater than a light discharged in the address period, when the number of subfields for a higher gray scale of the two adjacent gray scales is less than that for a lower gray scale of the two adjacent gray scales.

Here, the derivation of the determining step is unclear, i.e. it is unclear as to how the determining step of the instant claimed method calculates the gray scale expression. First, the calculation for the determining step use two adjacent gray scales, yet it does not define what '*two adjacent gray scales*' it is referring to, i.e. the pixels next to each other (i.e. linearly), the pixels horizontally next to each other (i.e. spatially), or the grayscale surrounding the pixel. Second, the limitation that '*the number of sustain pulses for each subfield so that a light generated from the difference of the number of sustain pulses between two adjacent gray scales can be greater than a light discharged in the address period*' implies that the sustain pulse of one subfield is calculated base on the difference of '*two adjacent gray scales*' that is greater than the address period of the subfield, which is perplexing since the sustain pulse is base of the address period, i.e. gray-scale display is achieved by associating bits of display data (address period) with the subframes, and changing the lengths of the sustaining periods within the subframes according to the weights imposed on the bits. Third, the limitation that '*the number of subfields for a higher gray scale of the two adjacent gray scales is less than that for a lower gray scale of the two adjacent gray scales*' implies that the higher gray scale is less than the lower gray scale, which is the reverse of art recognize driving method for gray scale expression in plasma display panel.

Consequently, the nature of the invention cannot be fully determined because the invention has not been defined with particularity, i.e. how the gray scale expression is derived.

(3 and 5) The state of the prior art and the level of predictability in the art:

As disclosed in the specification, the driving method of the instant claims is related to the ADS (Address and Display period Separated) driving method wherein the address and sustain period are separated (see specifications pg. 2). The time sequence of ADS is made of several subfields, and each subfield consists of reset, address and sustain periods. Gray-scale display is achieved by associating bits of display data with the subframes, and changing the lengths of the sustaining periods within the subframes according to the weights imposed on the bits. For example in the case of eight subfield time sequence, the subfield weights are in the ratio of 1:2:4:8:16:32:64:128, and in the case of six subfield time sequence, the subfield weights are in the ratio of 8:16:32:64:128 wherein the first subframe has the lower subfield weight and the last subfield has the higher subfield weight. One disadvantage of ADS is dynamic false contour, i.e. disturbance of gradation when displaying moving images, that is solved by increasing the number of subfield or optimizing each subfield weight such as arranging the sub-fields such that an average of light intensity within a time corresponding to one field becomes small at times preceding and succeeding to shift up or shift down of bit or reducing a display time within one field. See e.g. US Patent 5,541,618 (especially col. 3, line 24 thru col. 6, line 33); US Patent 5,898,414 (especially col. 1, lines 33-38); US Patent 6,323,880 B1 (especially col. 3, line 10 thru col. 4, line 62); Seo et al. (especially pg. 407, left col., line 9; *IEEE Transactions on Consumer Electronics*, 5/2004, 50(2), pgs. 107-412).

Accordingly, the instant claimed method is perplexing regarding the determining step for it is unclear as to the correlation regarding how the gray scale expression is determine in the instant claimed method with that known in the art.

(4) The level of one of ordinary skill in the art:

The level of skill would be high, most likely at the Ph.D. level in electrical engineer.

(6-7) The amount of direction provided by the inventor and the existence of working examples:

Although, applicant has provided no working example, the disclosure of the instant specification provided a table of subfield weight and the number of sustain pulses (see specification figure 4(a)) and a table of subfield structure by gray scales using the number in the table of figure 4(b)(see specification pg. 10, line 20 thru pg. 11, line 21). The specification is silent regard how the derivations of subfield weight and the number of sustain pulses are determine for the table of figure 4(a). Therefore, the amount of direction provided is insufficient for the instant claimed method specifically for the determining step.

(8) The quantity of experimentation needed to make or use the invention based on the content of the disclosure:

Accordingly, the broad and unpredictable nature of the invention and the lack of specific guidance from the specification, the examiner contends that the quantity of experimentation needed to make and or use the invention would be great. Note that there must be sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and use the invention as broadly as it is claimed. *In re Vaeck*, 947 F.2d 488, 496 & n.23, 20 USPQ2d 1438, 1445 * n.23 (Fed. Cir. 19991). In this case although applicants have not

Art Unit: 2629

provided any working examples, the amount of direction provided by the instant disclosure is insufficient for the instant claimed method specifically for the determining step wherein the gray scale expression is determine. Therefore, due to the inadequacies of the instant disclosure one of ordinary skill would not have a reasonable expectation of success and the practice of the full scope of the invention would require undue experimentation.

Therefore based on the evidences as a whole regarding each of the above factors (e.g. factors 1-8), the specification, at the time the application was filed, does not satisfy the enablement requirement for the instant claimed method, i.e. a gray-scale representation method for a plasma display panel.

3. Claims 4-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This is an enablement rejection.

There are many factors to consider when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any experimentation is “undue”. These factors include, but are not limited to: 1) The breadth of the claims; 2) The nature of the invention; 3) The state of the prior art; 4) The level of one of ordinary skill; 5) The level of predictability in the art; 6) The amount of direction provided by the inventor; 7) The presence or absence of working examples; and 8) The quantity

of experimentation necessary needed to make or use the invention based on the disclosure. See *In re Wands* USPQ 2d 1400 (CAFC 1988).

(1-2) The breadth of the claims and the nature of the invention:

The claims are drawn to a gray-scale representation method for a plasma display panel. The method comprises the steps of a) arranging, in time sequence, a plurality of subfields each having a brightness weight, and achieving gray-scale representation by a combination of the respective subfields, each subfield including an address period and a sustain period; and b) determining the number of sustain pulses for each subfield so that a light for the higher one of two adjacent gray scales, the light for the higher one of two adjacent gray scales including a light discharged in the whole address period of the subfields combined together to represent the higher gray scale and a light discharged in the whole sustain period, can be greater than a light for the lower gray scale, the light for the lower gray scale including a light discharged in the whole address period of the subfields combined together to represent the lower gray scale and a light discharged in the whole sustain period.

Here, the derivation of the determining step is unclear, i.e. it is unclear as to how the determining step of the instant claimed method calculates the gray scale expression. First, the calculation for the determining step use two adjacent gray scales, yet it does not define what '*two adjacent gray scales*' it is referring to, i.e. the pixels next to each other (i.e. linearly), the pixels horizontally next to each other (i.e. spatially), or the grayscale surrounding the pixel. Second, the limitation that '*a light for the higher one of two adjacent gray scales can be greater than a light for the lower gray scale*' implies that the higher gray scale is less than the lower gray scale, which is the reverse of art recognize driving method for gray scale expression in plasma display

panel. Furthermore, the claims define the higher gray scale as '*the light for the higher one of two adjacent gray scales including a light discharged in the whole address period of the subfields combined together to represent the higher gray scale and a light discharged in the whole sustain period*', i.e. the higher gray scale is the summation of '*the whole address period of the subfields*' and the whole sustain period, and the lower gray scale is defined as '*a light discharged in the whole address period of the subfields combined together to represent the lower gray scale and a light discharged in the whole sustain period*', i.e. the lower gray scale is the summation of '*the whole address period of the subfields*' and the whole sustain period. This implies that the high gray scale and the lower gray scale are equal, and as a result the derivation of the determining step is unclear, i.e. '*determining the number of sustain pulses for each subfield so that a light for the higher one of two adjacent gray scales can be greater than a light for the lower gray scale*'.

Consequently, the nature of the invention cannot be fully determined because the invention has not been defined with particularity.

(3 and 5) The state of the prior art and the level of predictability in the art:

As disclosed in the specification, the driving method of the instant claims is related to the ADS (Address and Display period Separated) driving method wherein the address and sustain period are separated (see specifications pg. 2). The time sequence of ADS is made of several subfields, and each subfield consists of reset, address and sustain periods. Gray-scale display is achieved by associating bits of display data with the subframes, and changing the lengths of the sustaining periods within the subframes according to the weights imposed on the bits. For example in the case of eight subfield time sequence, the subfield weights are in the ratio of 1:2:4:8:16:32:64:128, and in the case of six subfield time sequence, the subfield weights are in

the ratio of 8:16:32:64:128 wherein the first subframe has the lower subfield weight and the last subfield has the higher subfield weight. One disadvantage of ADS is dynamic false contour, i.e. disturbance of gradation when displaying moving images, that is solve by increasing the number of subfield or optimizing each subfield weight such as arranging the sub-fields such that an average of light intensity within a time corresponding to one field becomes small at times preceding and succeeding to shift up or shift down of bit or reducing a display time within one field. See e.g. US Patent 5,541,618 (especially col. 3, line 24 thru col. 6, line 33); US Patent 5,898,414 (especially col. 1, lines 33-38); US Patent 6,323,880 B1 (especially col. 3, line 10 thru col. 4, line 62); Seo et al. (especially pg. 407, left col., line 9; *IEEE Transactions on Consumer Electronics*, 5/2004, 50(2), pgs. 107-412).

Accordingly, the instant claimed method is perplexing regarding the determining step for it is unclear as to the correlation regarding how the gray scale expression is determine in the instant claimed method with that known in the art.

(4) The level of one of ordinary skill in the art:

The level of skill would be high, most likely at the Ph.D. level in electrical engineer.

(6-7) The amount of direction provided by the inventor and the existence of working examples:

Although, applicant has provided no working example, the disclosure of the instant specification provided a table of subfield weight and the number of sustain pulses (see specification figure 4(a)) and a table of subfield structure by gray scales using the number in the table of figure 4(b)(see specification pg. 10, line 20 thru pg. 11, line 21). The specification is silent regard how the derivations of subfield weight and the number of sustain pulses are

determine for the table of figure 4(a). Therefore, the amount of direction provided is insufficient for the instant claimed method specifically for the determining step.

(8) The quantity of experimentation needed to make or use the invention based on the content of the disclosure:

Accordingly, the broad and unpredictable nature of the invention and the lack of specific guidance from the specification, the examiner contends that the quantity of experimentation needed to make and or use the invention would be great. Note that there must be sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and use the invention as broadly as it is claimed. *In re Vaeck*, 947 F.2d 488, 496 & n.23, 20 USPQ2d 1438, 1445 * n.23 (Fed. Cir. 19991). In this case although applicants have not provided any working examples, the amount of direction provided by the instant disclosure is insufficient for the instant claimed method specifically for the determining step wherein the gray scale expression is determine. Therefore, due to the inadequacies of the instant disclosure one of ordinary skill would not have a reasonable expectation of success and the practice of the full scope of the invention would require undue experimentation.

Therefore based on the evidences as a whole regarding each of the above factors (e.g. factors 1-8), the specification, at the time the application was filed, does not satisfy the enablement requirement for the instant claimed method, i.e. a gray-scale representation method for a plasma display panel.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The term '*adjacent gray scales*' of claims 1 and 4 is vague and indefinite because it is unclear as to the means of determining '*adjacent*' gray scale. It is unclear what constitutes the metes and bounds of '*adjacent*' gray scale, i.e. does adjacent refers to the pixels next to each other (i.e. linearly), the pixels horizontally next to each other (i.e. spatially), or the grayscale surrounding the pixel. Thus, the claims 1 and 4 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

b. The limitation that '*the number of sustain pulses for each subfield so that a light generated from the difference of the number of sustain pulses between two adjacent gray scales can be greater than a light discharged in the address period*' of claim 1 is vague because it is unclear how '*the number of sustain pulses for each subfield*' is calculated for the limitation implies that the sustain pulse of one subfield is calculated base on the difference of '*two adjacent gray scales*' that is greater than the address period of the subfield. This is perplexing since the sustain pulse is base of the address period, i.e. gray-scale display is achieved by associating bits of display data (address period) with the subframes, and changing the lengths of the sustaining periods within the subframes according to the weights imposed on the bits. As a result, claim 1 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

c. The limitation that '*the number of subfields for a higher gray scale of the two adjacent gray scales is less than that for a lower gray scale of the two adjacent gray*

scales' of claim 1 is vague because it is unclear how '*the number of sustain pulses for each subfield*' is calculated for the limitation implies that the higher gray scale is less than the lower gray scale, which is the reverse of art recognize driving method for gray scale expression in plasma display panel. Therefore, claim 1 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

d. The determining step of claim 4 is vague because it is unclear because it is unclear how '*the number of sustain pulses for each subfield*' is calculated. The determining step of claim 4 recite the limitation that '*a light for the higher one of two adjacent gray scales can be greater than a light for the lower gray scale*' implies that the higher gray scale is less than the lower gray scale, which is the reverse of art recognize driving method for gray scale expression in plasma display panel. Furthermore, the claims define the higher gray scale as '*the light for the higher one of two adjacent gray scales including a light discharged in the whole address period of the subfields combined together to represent the higher gray scale and a light discharged in the whole sustain period*', i.e. the higher gray scale is the summation of '*the whole address period of the subfields*' and the whole sustain period, and the lower gray scale is define as '*a light discharged in the whole address period of the subfields combined together to represent the lower gray scale and a light discharged in the whole sustain period*', i.e. the lower gray scale is the summation of '*the whole address period of the subfields*' and the whole sustain period. This implies that the high gray scale and the lower gray scale are equal, and as a result it is unclear how '*the number of sustain pulses for each subfield*' is

calculated. Therefore, claim 4 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T. TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on 571-272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

My-Chau T. Tran
February 12, 2007

2/12/07
MY-CHAU T. TRAN
PATENT EXAMINER